

THE SALVATION OF HIBIS TEMPLE

EL-KHARGA – EGYPT



A UNIQUE ANGLO EGYPTIAN COOPERATION IN THE FIELD
OF STRUCTURAL ENGINEERING

the temple - by Dr Mustafa Ghamrawy

The location of the present temple is, most likely, a holy site of previous temples that may date back to the Old and Middle Kingdoms of Egypt.

Work in the present temple started during the 26th dynasty (672 BC: 525 BC).

In the days of its construction, the temple occupied a dominant location in the middle of the old city of Hebet (the plough in the ancient Egyptian language) just to the north of the present city of El-Kharga. Only a few monuments still remain of this old city.

During the Persian occupation of Egypt (525 BC - 404 BC), King Darius I expanded the earlier Saite period temple renewing the inscriptions and adding a decorated gateway.

Additional structures were added to the temple during the reigns of Achoris (c. 390 BC), Nectanebo I (c. 380 BC), and Nectanebo II (c. 360 BC).

During the Ptolemaic Dynasty, Ptolemy II Philadelphus built the "Great Gateway" (c. 282 BC).

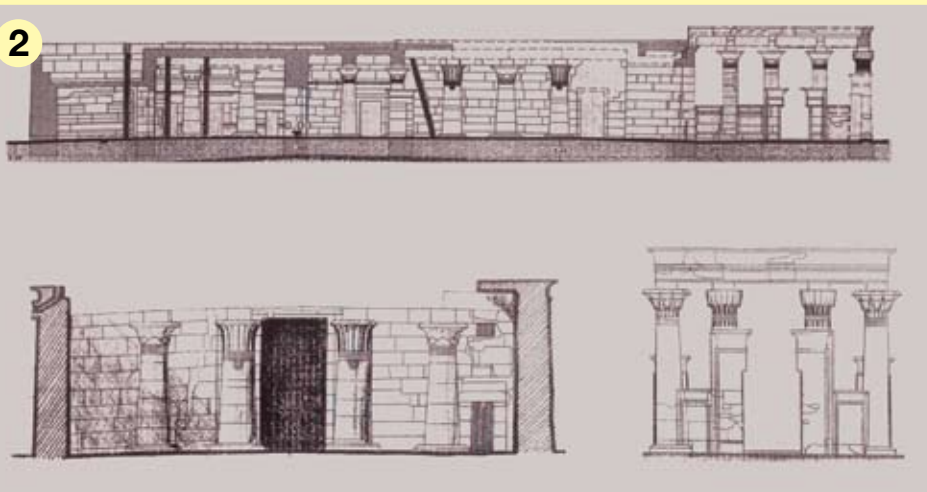
After the death of Nero in Rome 68 AD, four emperors ruled during one year. During the reign of one of them, Galba, a portal was added to the Hibis temple complex nearer to the landing stage on the lake.

At present the temple and its complex consist of the following:

- Landing stage on the lake.
- Avenue of sphinxes over which the Romans built the Outer Gateway. Closer in are the Ptolemaic Great Gateway and the Inner gateway decorated by Darius I.
- Bases for two obelisks or statues perhaps from the time of Achoris.
- A portico built by Nectanebo I (c. 390 BC), and later rebuilt by Nectanebo II (c. 360 BC). With eight floral columns separated by screen walls it contains numerous scenes of the king offering to the gods.
- The First Hypostyle Hall built during the reign of Achoris (c. 390 BC). It contains twelve columns on substantial foundations to support the roofing blocks.
- The Second Hypostyle Hall was constructed as part of the original temple (Saite Dynasty) with renovations during the reign of Darius I (after 522 BC). The screen walls are decorated with numerous scenes where the original paint still survives.
- Third (original) Hypostyle was constructed during the Saite Period. Darius I later added painted decorations on the columns in his renovation of the temple.



(1) The god Anubis with hieroglyphic inscription
(3) Detail of a hieroglyphic inscription and scene in plaster



(2) Sample elevation from the original 1941 Metropolitan Museum of Art's publication
(4) Example of the cartouche of Darius I

examination of Hibis Temple - by Professor Eugene Cruz-Uribe, Ph.D

a) *The Sanctuary*

The sanctuary (Room A) is perhaps the most fascinating room in the temple. On the three walls are inscribed essentially a catalogue of all of the deities of ancient Egypt.

Originally the rear wall of the sanctuary (west wall) was composed of a false door niche (seen in one photograph by the Metropolitan museum) and noted by Winlock in his excavation report. This was later built over with the present nine (9) panel format and matches the nine panels on the north and south walls.

The contents of the three walls are amazing. Each panel has a series of deities, 359 in total in the sanctuary. They seem to be organized in groups representing major cult centres. Each panel begins with a figure of the king making an offering (water, food, wine, oil, clothing, land, etc.). Most of the deities on the south wall represent the major cult centres in Upper Egypt. They start with the gods from the Philae region, followed by those from Elephantine and then progress northward skipping the deities of Thebes before going on with the deities of Middle Egypt. Of particular interest are:

Panel 1 - In the middle we see the various forms of Khnum of Elephantine. Figure of Khnum with his potter's wheel.

Panel 3 - We see the Seven Hathors. These goddesses are normally associated with the determining of a person's fate at birth.

Panel 5 - In the middle we see the deities from Hermopolis - led by the child sun god (labelled Re-Horakhty) who is shown emerging from the lotus flower at the moment of creation. He is attended by the Ogdoad of Hermopolis (lion and snake headed).

The west wall is composed entirely of the deities from the Theban region with a myriad of forms of the god Amun-Re. The top four Panels are gone and only the lower ones remain. Even though a variety of gods and goddesses are depicted, the inscription by the king at the front of each panel says he is making an offering to Amun-Re.

The north wall continues a geographical list of deities from main cult centres focusing on those from northern Upper Egypt and the Memphite area. We should especially note:

Panel 3 - We find a series of figures of the goddess Astarte, including one where she is riding a horse side saddle.

Panel 7 - We see the figure of Isis suckling a crocodile. The inscriptions at the front vary with the king offering to Amun-Re or to the great gods.

What we seem to have happening here is the worship of mainly Amun-Re as king of the gods / universal god as promoted in the Theban region, but shown by his universal character as being identified with all of the gods from all over Egypt.

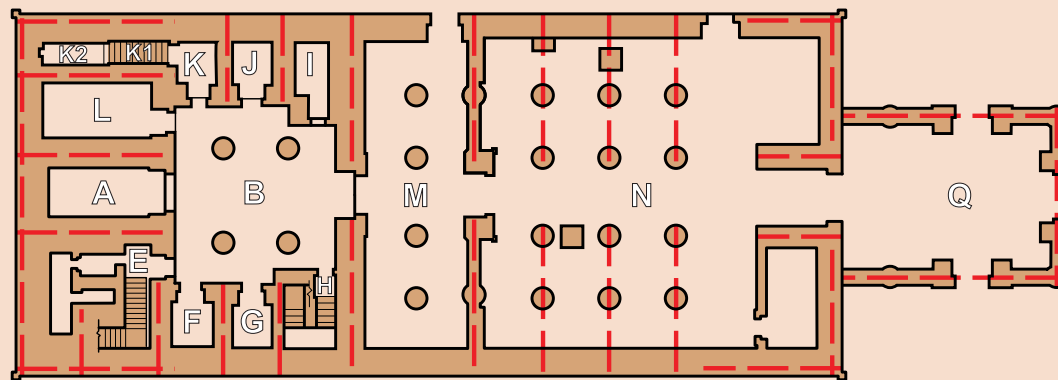
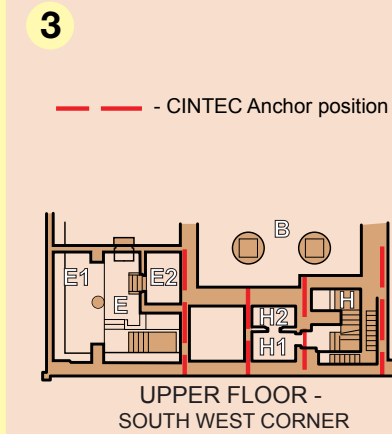
The deities from Lower Egypt seem to have been added in on the reveals of the door when the sanctuary was reconstructed later in the Persian period.

Room L - The Kingship room.

This room is located just north of the sanctuary. Architecturally it is quite interesting because it contains a pillar blocking the view of some of the scenes on the south wall just inside the doorway. It would appear that the roof blocks must have been damaged (potentially in an earthquake) or by settling in the foundation, and the ancient builders inserted a column during their repair work to support the ceiling.

I call this the kingship room because of the main themes found on the decorations. On the south wall we have numerous scenes of the king offering to gods, but also several where the king is being lead by the gods as part of the coronation ritual. There is also a scene of the gods Khnum and Ptah fashioning the king on a potter's wheel.

This scene is unique from ancient Egypt.



(1) The Portico

(2) The South Wall support

(3) The Position of the CINTEC Anchors

examination of Hibis Temple *continued*

The west wall is covered entirely by a scene of the king on his throne with Thoth and Horus tying the cords around the base of the scene in the “sema-tawy” ritual. This ritual signifies the unification of upper and lower Egypt in the person of the king. The entire north wall is covered by a long hieroglyphic text which is an acclamation of the king as Horus as well as being identified with a series of gods:

Shu, Geb, Osiris, Horus, Ptah-Sokar, Harsaphes, Min-Re, Min-Horus, Min, Isis, Horuskhentyorty, Thoth, Maat, Khnum, Anubis, Anuris, Khonsu, Isis, Osiris, Horus, Nephthys and Neith.

Room K - K1 -K2 - Osiris - Re complex

The small chamber in the northwest corner next to room L is a series of a small rooms with a stairwell leading up to another chamber with a small pit. This room involves the rejuvenation of the god Osiris in the feast of Choiak. This is followed by the stairwell whose two walls are covered by two separate inscriptions.

The inscriptions on the north wall give a section of chapter 146 of the Book of the Dead converted to temple ritual use. Here the god Osiris is passed through the netherworld. This inscription is followed then by the south wall inscription where we have the god transformed into a sun god. This leads to the appearance of Osiris -Re in the back of the chamber above the pit and the associated scenes on the north and south walls worshipping

the resurrected sun god in his form as Osiris-Re.

Room I - A Storeroom

Room I is the chamber immediately to the right as you enter Hypostyle B. It juts out from the corner and parallels the stairwell on the south side of the area. It is the only room in this part of the temple which is un-inscribed on the inside. However, the series of inscriptions around the door tells us this room is a linen storage room. It stored the linen cloth used in the various daily rituals in clothing the god. The room has figures of the goddess Tait shown as a snake headed woman. The inscriptions warn all those that enter the room to be ritually purified suggesting that touching the divine linen was reserved only for ritually purified priests who would perform the daily dressing ritual in the sanctuary. There is a parallel to this room found with similar inscriptions at Edfu temple.

Hypostyle B

The four columns dominate this hypostyle and provide access to the sanctuary and all of the connected rooms. Architecturally this chamber is not entirely unique, but is not completely paralleled at other temples which often separate the side chambers from direct access to the sanctuary area. In my investigations of the room I discovered that each of the four columns had been decorated in painted scenes of the king

offering to the gods While most of these are mostly eroded, we were able to trace the outlines of most of the figures on all four columns. We also noticed that cartouches of the king in this chamber and all of the side rooms had been left blank at the time of construction except for two areas.

The first is up on the east wall where we have a scene of the king emerging from his palace (panel 2, south of door).

Here we have the Horus name of the king and it is identified as Psammetichus II (595-589 BC) .

The other area which has cartouches are on the reveals of the doorways. Here the name of Darius I (522-486 BC) is found carved in the cartouches. When we look at the blank cartouches on the north and south walls we notice that some of them have paint in them (blue). Especially the cartouche on the top/first panel on the south wall where we have the king offering to Anuris and Tefnut. There the cartouche is fully painted in with the name of Darius.

In a separate publication I examined all of these cartouches and was able to determine that Psammetichus II was the king who built the main part of the temple and that Darius I commissioned the reworking of the front of the temple (later covered over by hypostyle N with its 12 columns).

One architectural anomaly in hypostyle B can be observed on the north wall. If one looks closely it appears that there is some “damage” along the upper course of stone.

Close inspection reveals that when the stones were laid in place during construction, several of the stones had been improperly quarried too thick. Thus when the stones were put in position in the wall, they were levelled and adjusted using markings on the exterior side (this is clear when you go to the roof and examine these blocks).

After the work was done and the decoration of the interior walls began, it was discovered that these blocks stuck out 3-4 cm above the lower course of stones.

The workers then started to try and chisel the stone but quickly stopped after determining how much work it would be. They then simply chiselled off the lower section roughly and covered the area with white plaster and carved and decorated the scenes through the white plaster. Some of this plaster is still present on the walls.

Ancient Reconstruction of Hypostyle B

The next area to be discussed is the issue about the ancient fixing of the temple. As noted above in room L there is a column just inside the door which blocks part of the decoration on the south wall. This column actually was part of a major reconstruction effort that took place, probably during the Ptolemaic period (based upon the style of capital in room L). For some reason (either from an earthquake or from dramatic settling of

the western end of the temple), a large group of cracks appeared going through hypostyle B. These cracks can be seen on the inside and outside of the temple running along a north-south line through the doors of rooms K and F.

Around the door to K on the north side of hypostyle B we can see a series of blocks that have been placed to replace the damaged left reveal/jamb of the door. There is no carved decoration, just traces of paint on the surface.

On the door to F (south side of hypostyle B) we can see major reconstruction. Portions of the door jamb/reveal have been chiselled out and would have been filled with plaster. In addition the lintel of the door has been replaced by a blank block without decoration.

Above both of these doors one can see the repairs made to the other blocks which had suffered damage in ancient times. If you go outside and examine the exterior walls at the spots along that north-south axis, you will see that in ancient times the temple had been repaired.

A series of blocks, all undecorated, have been fitted into the exterior wall at these positions indicating a repair of destroyed stones. This was noted in the elevation drawing provided as plate 35 in the Winlock excavation report by his gray shaded blocks.

There are several other areas on the north and south exterior walls that show the same ancient repairs. It seems quite clear to me that at some point, probably during the Ptolemaic period, the temple suffered some severe damage and the local officials received permission to repair Hibis temple. To do these repairs they mainly replaced damaged blocks on the interior and exterior with blank / undecorated blocks.

Those areas that had decoration they painted the decorations on the stone and did not carve them.

Some of this painted decoration from the repairs can still be seen, especially on the door jamb of the door to room K.

the strengthening solution

The condition of the temple was that the external south, west and north walls were temporarily shored with timber raking shores. There was significant rotation of the foundations because cultivation and irrigation of the soil adjacent to the footings had resulted in heave and shrinkage of the clay soils.

The installed drainage trench around the monument will prevent further disturbances in the soil around temple. Due to the nature and condition of this temple no vibration could be introduced in the drilling stage so dry diamond drilling techniques were used using compressed air to cool the drill bits and flush the dust from the holes.

The Cintec socked anchor system prevented grout from damaging the delicate hieroglyphs that covered the internal and external walls.

It was decided to stitch all the elements of the temple to stabilise the walls and enable the timber raking shores to be removed. The large open spaces in the temple made it difficult to tie laterally across the temple so most of the internal walls were used to tie the external walls horizontally to the internal structure. The wealth of hieroglyphs on the walls contributed to the difficult location of the Cintec anchors.

All the walls were surveyed and the anchors were installed in damaged or missing areas of hieroglyphs.

The large areas of walls without internal walls were strengthened using inclined Cintec anchors 9m long from the top of the walls to the foundations, bridging the vertical cracks. Each corner of the structure was strengthened in this way in addition to horizontal anchors up to 10m long.

The temple was constructed in certain areas of two stones butted together to form the overall thickness of the walls, these had shown signs of delamination and were consolidated using Cintec stitching anchors, this tied the two leaves together creating a solid wall again.

The outer portico of the temple was also showing signs of movement so Cintec anchors were used horizontally and vertical. Anchors were installed into the columns to create an internal invisible frame.

Large new lintel stones were quarried from the original quarry and placed in their original positions over the columns in the outer hypostyle.

Cintec anchors were then installed through the outer walls and the new lintel stones laterally tying the north wall to the south wall.

The existing and rebuilt outer gateways were anchored horizontally through the roof slabs and vertically into each corner to add additional stability to the structures.

Several anchors were used throughout the structure to consolidate broken or cracked stones and slabs above internal rooms.

Upon completion the external raking shores were removed allowing the structure to be viewed unsupported for the first time in many years.



(1) Securing the Ground
(3) The finished hole ready for the anchor

(2) Drilling for the Anchor
(4) Inserting the CINTEC Anchor

the ground solution

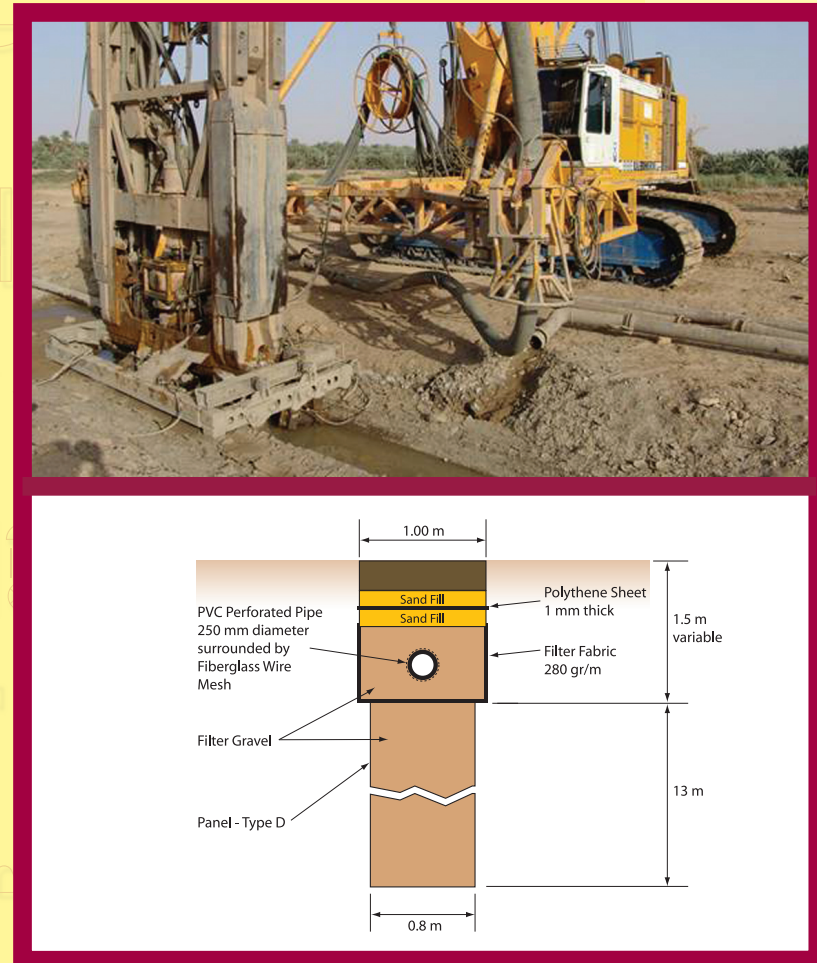
The main problem affecting the temple was the amount of ground and surface water that ingressed into the temple foundations causing differential movement of the structure.

This together with poor soil conditions caused serious structural problems in the temples superstructure. Normally, the pharonic constructors were very good at understanding the need for good foundations and it is a mystery why this temple was built on poor foundation conditions.

Solving the ground condition was the first priority. The local farmers were restricted to work at a safe area from the temple to reduce the amount of surface water entering the temple.

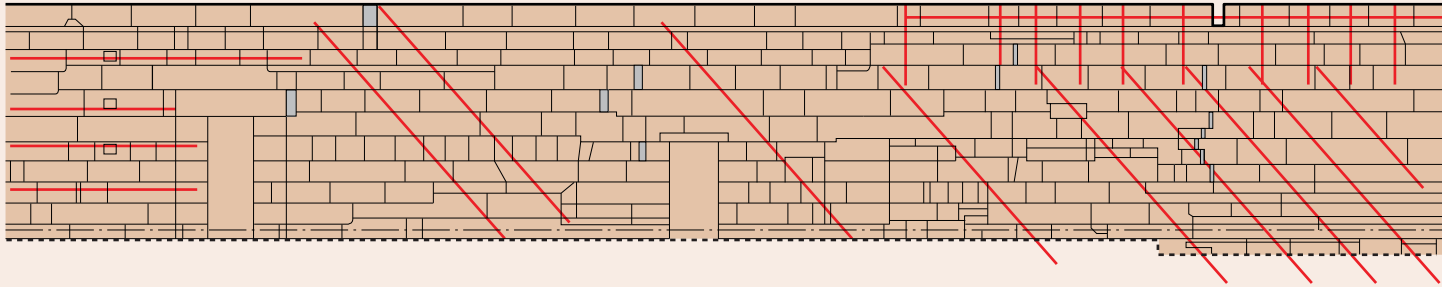
However, the main task was to isolate the main structure from the subsurface water by using a trench one metre wide and up to seventeen metres deep to completely surround the monument and make it a dry island in an oasis.

To overcome any water that might enter under this barrier a series of lime piles at four metre centres some up to seventeen meters deep were formed through the entire temple at ground level to absorb any other water penetration.



NORTH ELEVATION

1



(1) View of typical anchor arrangement to stabilise the outer walls of the temple. Each anchor position was carefully designed to satisfy the engineering requirements, but also were extremely sensitive to the delicate hieroglyphs adorning the temple walls.



(2) The original, supported corner



(3) The finished, secured corner



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